Amendments to the claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1 to 12 are canceled

13. (Currently amended) A method of transmitting variable length packets associated with a destination address through a network element having a plurality of ingress cards, a plurality of egress cards and a cell-based switch fabric between said ingress cards and said egress cards, the method comprising:

a) segmenting at said ~~one of said plurality of~~ ingress cards each incoming packet ~~received in a plurality of ingress traffic flows~~ into a group of fixed length cells containing routing information;

b) arranging said groups of fixed length cells into at least one group of corresponding traffic flows ~~and ordering the cells in sequential packet order, said each incoming packet and said fixed length cells being associated with a destination address~~;

~~b~~c) transmitting toward a particular egress card ~~each of said packet-ordered fixed length cell into a plurality of packet-ordered streams to one of said plurality of egress cards according to the destination address of the each packet, said plurality of packet-ordered streams transmitting cells simultaneously over the network element towards the one egress card~~the cells of a particular group of traffic flows on a cell-by-cell basis in an ordered sequence such that each group of cells from said particular group of traffic flows is transmitted as a contiguous group of cells without being interleaved with other cells;

d) transmitting toward said particular egress card the cells of another traffic flow or group of traffic flows on a cell-by-cell basis in a packet ordered sequence such that each group of cells from said another group of traffic flows is transmitted as a contiguous group of cells without being interleaved with other cells;

e) said cells being subject to becoming interleaved during transmission toward said egress card;

f) at said particular egress card assigning arriving cells on a cell-by-cell basis to one of a plurality of reassembly queues associated with the respective groups of traffic flows or traffic flows so as to form in each reassembly queue a non-interleaved ordered sequence

of groups of contiguous cells corresponding to the segmented incoming packets from the group of traffic flows or traffic flow associated with that reassembly queue;

~~c~~g) ~~assigning said each cell in one of said respective packet ordered streams to a reassembly queue in a plurality of reassembly queues at said one egress card according to the destination address, and r~~reassembling the groups of contiguous ~~each~~ cells in ~~the~~ each reassembly queue into the ~~each~~ corresponding incoming packets; and

~~d~~h) transmitting the reassembled packets in an egress traffic flow from the network element ~~towards the destination address,~~

~~wherein each reassembly queue can accept cells from more than one ingress traffic flow of said plurality of ingress traffic flows~~.

14. (Currently amended) The method of claim 13, wherein the ~~plurality of ingress traffic flows~~incoming packets carry data formatted according to one or more communication protocols.

15. (Previously presented) The method of claim 14, wherein said protocols are one or more of ATM, MPLS, and IP protocols.

16.(Currently amended) The method of claim 13, wherein ~~the each cell is switched to one of said plurality of packet ordered streams based on~~groups of traffic flows correspond to respective ~~a~~ classes of service associated with ~~the~~ an ingress traffic flow ~~flow from which the network element received the incoming packet associated with the each cell~~.

17.(Currently amended) The method of claim 16, wherein ~~step c) further comprises providing associating one of said plurality of~~a said reassembly queues is associated with ~~to~~ each class of service ~~associated with the plurality of ingress traffic flows~~ for an ingress traffic flow.

18.(Previously presented) The method of claim 16, wherein the class of service indicates a high, medium and low traffic priority.

19.(Currently amended) The method of claim 13, further comprising assigning weights to ~~ing~~ packets ~~from each~~associated with ingress traffic flows, and assigning resources to the groups of traffic flows associated with the ingress traffic flows in accordance with the assigned weights ~~for switching each packet-ordered cell of the packets into a respective one of the plurality of packet-ordered streams, wherein each of said plurality of packet-ordered streams is associated with a traffic flow priority~~.

20.(Currently amended) A network element having a cell-based switch fabric for switching variable-length~~s~~ packets, comprising:

at least one ingress card, the or each ingress card having groups of segmentation queues for storing groups of fixed length cells corresponding to segmented incoming packets;

each group of segmentation queues providing a group of traffic flows;

~~a segmenting module for segmenting each incoming packet received from a plurality of ingress flows into fixed length cells;~~

an ~~n~~ ordering module for ordering groups of ~~the~~ cells from the ~~segmenting~~segmentation queues of a particular group of traffic flows ~~module~~ in sequential packet order and forwarding the cells through a switch fabric toward an egress card such that each group of cells from the particular group of traffic flows is transmitted toward the egress as a packet ordered contiguous group of cells without being interleaved with other cells;~~;~~

at least one additional ordering module for ordering groups of cells from the segmentation queues of another group of traffic flows or traffic flow in sequential packet order and forwarding the cells through the switch fabric toward an egress card such that each group of cells from said another group of traffic flows is transmitted toward the egress card as a packet ordered contiguous group of cells without being interleaved with other cells;

~~a switching module for switching each packet-ordered cell into one of a plurality of packet-ordered streams according to a destination address associated with the each packet,~~

~~said plurality of packet-ordered streams transmitting cells simultaneously over the network element;~~

~~a~~ reassembly queues at the egress card associated with ~~the destination address for~~for the respective groups of traffic flows or traffic flows for reassembling cells ~~associated with~~

~~the destination address~~ into ~~the~~ outgoing ~~each~~ packets~~,~~ and transmitting the ~~each reassembled~~outgoing packets in an egress flow towards the destination address; and

an assignment module for assigning each ~~each~~ cell arriving from the switch fabric on a cell-by-cell basis to the reassembly queue ~~among a plurality of reassembly queues according to the destination address associated with the each packet, each reassembly queue being associated with a different destination address~~associated with the group of traffic flows or traffic flow to which that cell belongs so as to form in the reassembly queue a non-interleaved order sequence of groups of cells corresponding to the segmented incoming packets from the group of traffic flows or traffic flow associated with that reassembly queue~~,~~

~~wherein each reassembly queue can accept cells from more than one ingress flow of said plurality of ingress flows~~.

21.(Currently amended) The network element of claim 20, wherein the ~~segmenting module and the~~ ordering module ~~are~~ is provided on an ingress card of the network element.

22.(Previously presented) The network element of claim 20, wherein the plurality of reassembly queues and the assignment module are provided on an egress card of the network element.

23.(Previously presented) The network element of claim 20, wherein the plurality of reassembly queues are implemented using a FPGA.

24.(New) A method of transmitting variable length packets through a network element containing a switch fabric, comprising:

segmenting incoming packets associated with a destination address into groups of sequential cells defining a segmentation sequence;

providing said cells with an internal header containing routing information through the switch fabric based on the destination address of their corresponding packets;

forwarding the cells to the switch fabric in a packet ordered fashion such that the cells associated with each packet arrive at the switch fabric in their segmentation sequence;

transporting the cells through the switch fabric over the same path such that the cell order is maintained within the switch fabric; and

at an output side of the switch, placing the cells on a cell-by-cell basis into a reserved reassembly queue corresponding to the routing information contained in the cells; and

reassembling the original incoming packets by removing the internal headers and combining groups of sequential cells in said reserved reassembly queue.

25.(New) A method of reassembling segmented packets received from a network element, wherein the incoming packets arrive at an ingress side of the network element in a plurality of traffic flows, said incoming packets are segmented into groups of cells for transport through the network element, the cells within each group of cells corresponding to an incoming packet being ordered in a segmentation sequence, and wherein the individual cells transported through the network element may leave an egress side of the network element as a stream of interleaved cells associated with different incoming packets and different ingress traffic flows, comprising:

providing a reassembly queue at an egress card of said network element corresponding to each ingress traffic flow and being capable of storing a plurality of groups of cells;

assigning the individual cells arriving from the network element on a cell-by-cell basis to the reassembly queue associated with the ingress traffic flow carrying the packet from which each arriving cell originated; and

ordering the cells assigned to the respective reassembly queues so that the reassembly queues contain groups of cells corresponding to specific incoming packets wherein the cells within each group of cells are contiguous and arranged in the correct segmentation sequence for that group of cells; and

reassembling the original incoming packets of the traffic flow associated with each reassembly queue by combining the groups of contiguous cells in the respective reassembly queues.

26.(New) The method of claim 25, wherein each ingress traffic flow is segmented into multiple traffic flows, and the cells of each group of cells in the multiple traffic flows of each ingress flow are forwarded to the network element in a non-interleaved manner by a cell ordering module.

27.(New) The method of claim 25, wherein each ingress traffic flow is divided into traffic flows of different priority, and each priority traffic flow is associated with a corresponding reassembly queue at the egress card.

28.(New) A reassembly resource for reassembling packets arriving at an ingress side of a network element in a plurality of traffic flows, wherein said packets are segmented into groups of cells for transport through the network element, the cells within each group of cells being ordered in a segmentation sequence, and wherein the individual cells transported through the network element may leave an egress side of the network element as a stream of interleaved cells associated with different cell packets and different ingress traffic flows, comprising:

a reassembly queue at an egress card of said network element corresponding to each ingress traffic flow and capable of storing a plurality of cell packets associated with a particular ingress traffic flow;

an assignment module for assigning the cells arriving from the network element on a cell-by-cell basis to the reassembly queue associated with the ingress traffic flow carrying the packet from which each arriving cell originated such that the reassembly queues contain groups of cells corresponding to specific incoming packets wherein the cells within each group of cells are contiguous and arranged in the segmentation sequence for that group of cells; and

a reassembler for reassembling the original incoming packets of the traffic flow associated with each reassembly queue by combining the groups of contiguous cells in the respective reassembly queues.